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09/627,573	07/28/2000	Haixiang Liang	1005-0013	2339

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EXAMINER

ODOM, CURTIS B

ART UNIT	PAPER NUMBER
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2634

DATE MAILED: 11/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/627,573

Applicant(s)

LIANG, HAIXIANG

Examiner

Curtis B. Odom

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 July 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 July 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Claim Objections***

1. Claim 16 is objected to because of the following informalities: The phrase “at least two” is suggested to be changed to “at least two instances”. Appropriate correction is required.
2. Claims 26 is suggested to be deleted. It is a duplicate of claim 20. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 101***

3. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 1-9 are rejected under 35 U.S.C. 101 because claims 34-36 are directed to the characteristics of the signal. Note this signal merely consists of “1” and “0” to represent the coded signal. It does not fall into the category of a method, apparatus, product, or composition of matter. Therefore, the claims are rejected under 35 U.S.C 101 for being directed toward non-statutory subject matter.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 10-13, 15, 16, 18-24, and 26 are rejected under 35 U.S.C. 102(e) as being anticipated by Tung et al. (U.S. Patent No. 6, 512, 787).

Regarding claim 10, Tung discloses a communication system susceptible to one or more potential impairments (Fig. 1, column 5, lines 9-15) each periodic in an integer number of symbols transmitted across a communications channel (column 5, lines 19-29), wherein the mappers are symbols which represent each phase of the RBS period, the communication system comprising:

a receiver (Fig. 2, block 200, column 6, line 18-column 7, line 56) to receive an impairment compensation sequence, the impairment compensation sequence including:

N phases (column 4, lines 39-47 and column 5, lines 12-29), wherein N is selected such that each potential impairment, if present, is periodic therein, wherein the DIL sequence includes mappers (symbols) corresponding to each phase of the digital impairment, and

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a sequence of symbols, the sequence organized to place at least one instance of each symbol from a predetermined set of symbols in each phase (column 5, lines 12-47) to allow detection of the potential impairments in each of the N phases (column 7, lines 38-56), wherein the mappers are symbols or predetermined symbols (column 5, lines 30-47) corresponding to each phase (column 5, lines 12-29) that allow detection of the potential impairments in each phase (column 7, lines 38-56); and

an equalizer (Fig. 2, block 220, column 6, lines 55-64) to equalize the impairment compensation sequence, the equalizer producing amplitude estimates of the sequence of symbols, wherein the filtered samples are amplitude estimates of the sequence of symbols.

Regarding claim 11, which inherits the limitations of claim 10, Tung et al. discloses the sequence includes a number of segments, the number corresponding to a number of elements in the predetermined set of symbols (column 5, lines 20-23), wherein the number of segments in this instance is 128.

Regarding claim 12, which inherits the limitations of claim 10, Tung et al. discloses the potential impairments include at least one of RBS, padding, and a combination of RBS and padding (column 5, lines 12-15).

Regarding claim 13, which inherits the limitations of claim 10, Tung et al. disclose the predetermined set of symbols includes at least a subset of a universal PCM codeword set (column 2, lines 49-61, column 5, lines 10-12, and column 5, line 47-column 6, line 5).

Regarding claim 15, Tung et al. discloses N is a least common multiple of respective periods of each of the potential impairments (column 4, lines 19-24).

Regarding claim 16, which inherits the limitations of claim 10, Tung et al. discloses the sequence is organized to place at least two instances of the symbol from the predetermined set of symbols in each phase (column 8, Table 1), an average of received values corresponding to the at least two instances improving an estimation of the symbol (column 7, lines 10-15), wherein Table 1 shows two instances of the symbol (X) in each phase.

Regarding claim 18, the claimed method includes features corresponding to subject matter mentioned above in the rejection of claim 1 which is applicable hereto.

Regarding claim 19, which inherits the limitations of claim 19, Tung et al. discloses the channel includes a digital portion of a PSTN and wherein the potential impairments include at least one of RBS, padding, and a combination of RBS and padding in the digital portion of the PSTN (column 5, lines 9-15), wherein the digital portion of the channel is apart of a PSTN.

Regarding claim 20, which inherits the limitations of claim 18, Tung et al. discloses the sequence of symbols (mappers) is a DIL sequence (column 2, lines 37-48).

Regarding claims 21-24, the claimed method includes features corresponding to subject matter mentioned above in the rejection of claims 11, 13, 15 and 16 which is applicable hereto.

Regarding claim 26, which inherits the limitations of claim 18, Tung et al. discloses the sequence of symbols (mappers) is a DIL sequence (column 2, lines 37-48).

### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 14, 25, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tung et al. (U.S. Patent No. 6, 512, 787).

Regarding claim 14, which inherits the limitation of claim 10, Tung et al. does not disclose the N phases include 24 time phases. However, Tung et al. does disclose the N phases include 6 or 12 time phases (column 4, lines 20-24), wherein the code phases are time phases. Tung et al. also discloses the phases are determined according to the phases of the impairments (column 5, lines 20-29). Therefore, it would have been obvious to one skilled in the art at the time the invention was made that if there were 24 phases of the impairment, then N phases would also include 24 phases to map the impairment.

Regarding claim 25, which inherits the limitations of claim 24, Tung et al. does not disclose the subset is selected in accordance with power constraints. However, Tung et al. does disclose the subset is a subset of a universal PCM codeword set (column 2, lines 49-61, column 5, lines 10-12, and column 5, line 47-column 6, line 5). Therefore, it would have been obvious to one skilled in the art at the time the invention was made that universal PCM codeword sets are arranged according to power. Thus, choosing a subset from a subset of universal PCM codeword sets would mean selecting a subset in accordance with a power constraints.

Regarding claim 27, which inherits the limitations of claim 18, Tung et al. discloses the sequence of symbols is compatible with a plurality of equalizers (column 26-54), but does not disclose the plurality of equalizes including partial response type equalizer structures. However, it would have been obvious to one skilled in the art at the time the invention was made that the

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use of a partial response equalizer could have been implemented to perform the same functions as the disclosed equalizers. Thus, the use of a partial response type equalizer is deemed a design choice and does not constitute patentability.

8. Claims 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tung et al. (U.S. Patent No. 6, 512, 787) in view of Gonikberg et al. (U.S. Patent No. 5, 864, 545).

Regarding claim 17, Tung et al. discloses all the limitations of claim 17 (see rejection of claim 1) including the impairment compensation sequence including a sequence of amplitudes (column 7, lines 2-24) from terminal equipment, the sequence organized to place at least one instance of each symbol from a predetermined set of symbols in each phase (column 8, Table 1) to allow detection of the potential impairments in each of the N phases (column 7, lines 38-56), wherein the absolute value of the received sample for each input code is the amplitude and Table 1 shows two instances of the symbol (X) in each phase; and

a decoder for decoding the sequence of amplitudes (Fig. 1, block 118, column 5, lines 47-column 6, line 5).

Tung et al. does not disclose a demodulator for demodulating a modulated impairment compensation sequence.

However, Gonikberg et al. discloses a demodulator for demodulating a modulated impairment compensation sequence (Fig. 7, blocks 771 and 772). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the device of Tung et al. with the demodulator of Gonikberg et al. to recover the original impairment compensation sequence which would simply further processing and analyzing of the sequence because of the absence of the carrier signal.



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9. Claims 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tung et al. (U.S. Patent No. 6, 512, 787) in view of Langberg et al. (U.S. Patent No. 5, 852, 630).

Regarding claims 28 and 29, Tung et al. discloses all of the subject matter as described in the previous rejection (see rejection of claim 17, except for the method written as a computer program product with a computer readable storage medium.

However, Langberg et al. teaches that the method and apparatus for a transceiver warm start activation procedure with precoding can be implemented in software stored in a computer-readable medium. The computer readable medium is an electronic, magnetic, optical, or other physical device or means that can contain or store a computer program for use by or in connection with a computer-related system or method (note column 3, lines 51-65). One skilled in the art at the time the invention was made would have clearly recognized that the method of Tung et al. would have been implemented into software. The implemented software would perform the same function of the hardware for less expense, greater adaptability, and greater flexibility. Therefore, it would have been obvious to have used the software in Tung et al. as taught by Langberg et al. in order to reduce cost and improve the adaptability and flexibility of the communication system.

### ***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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Olafsson et al. (U.S. Patent No. 6, 332, 009) discloses receiving an impairment compensation signal.


Krishnan et al. (U.S. Patent No. 6, 301, 296) discloses generating and receiving an impairment compensation signal.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Curtis B. Odom whose telephone number is 703-305-4097. The examiner can normally be reached on Monday- Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 703-305-4714. The fax phone numbers for the organization where this application or proceeding is assigned are 709-872-9306 for regular communications and 703-872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

Curtis Odom  
October 21, 2003

  
**STEPHEN CHIN**  
**SUPERVISORY PATENT EXAMINER**  
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